UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/574,898 | 04/06/2006 | Shinji Watanabe | 8017-1189 | 3401 |

466 7590 02/03/2009

YOUNG & THOMPSON
209 Madison Street
Suite 500
ALEXANDRIA, VA 22314

| EXAMINER | |
|---|---|
| LOUIE, WAI SING | |
| ART UNIT | PAPER NUMBER |
| 2814 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 02/03/2009 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/574,898 | WATANABE ET AL. | |
| | Examiner | Art Unit | |
| | Wai-Sing Louie | 2814 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 November 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *17-25,27,28,33,34 and 36-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-25,27,28,33,34 and 36-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17-25, 27, 33-34, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurita (US Pub. 2002/0135057) in view of Matsumura (US Pub. 2003/0101584).

With regard to claims 17-18, Kurita discloses a semiconductor device (¶ [0028] et seq. and fig. 4) comprising:

- A wiring substrate 13 including an insulating resin layer 7 having a first major surface and a second surface 15 and a first wiring layer 14 disposed on the insulating resin layer 7 on the second major surface 15 side (¶ [0031], [0048] and fig. 4);
- A second wiring layer 3 formed on the first major surface of the insulating resin layer 7 (¶ [0031] and fig. 4);
- A chip 1 including a projection electrode 2 on a bottom surface and mounted on the wiring substrate 13 (¶ [0028] and fig. 2), where the insulating resin layer 7 holds the chip 1 such that a bottom and at least a part of side surfaces of the chip 1 are in contact with the insulating resin layer 7 (fig. 4), and a top surface of the

chip 1 is exposed on the insulating resin layer 7 on the first major surface 15 side, and where the projection electrode 2 of the chip 1 is connected with the first wiring layer 3 (fig. 4);

- Kurita does not disclose the projection electrode 2 of the chip 1 having a sharp tip. However, Matsumura discloses the electrodes 18 have a sharp tip (Matsumura ¶ [0049] and fig. 5b). Matsumura teaches the sharp tip provides desirable contact with the electric parts (Matsumura ¶ [0006]). Therefore, it would have been obvious to one of ordinary skill in the art to modify Kurita's device with the teaching of Matsumura to provide a desirable contact with the electric parts.

With regard to claim 19, Kurita discloses a ground pattern is formed in the second wiring layer 3 (¶ [0036]).

With regard to claims 20-22, Kurita discloses a plurality of insulating resin layers 7 are laminated such that first major surfaces 15 are faced in the same direction for holding chip 1 and they are arranged on both surfaces of the wiring substrate 13 (fig. 3).

With regard to claims 23-24 and 33, in addition to the limitations disclosed in claim 17 above, Kurita also discloses:

- A wiring substrate 13 including a plurality of insulating resin layers 7 that are laminated (fig. 3) and have first major surfaces and second major surfaces 15 and a first wiring layer 14 disposed on the insulating resin layer 7 on the second major surface 15 side from a lowermost layer to an innermost layer in the insulating resin layers 7 (fig. 3);

- A second wiring layer 3 formed on the first major surface of the insulating resin layer 7 (fig. 3)

With regard to claims 25 and 34, Kurita discloses a portion exposed from the insulating resin layer 7 of the chip 1 that enters the insulating resin layer 7 pf the outermost layer in the wiring substrate 13 is covered by a coating resin (¶ [0008]).

With regard to claims 27 and 36, Kurita modified by Koyama disclose the projection electrode 12 is gold (Koyama ¶ [0056]).

With regard to claims 38-39, Kurita discloses the first major surface on which the second wiring layer 3 is formed is arranged below the top surface of the chip part 1 (fig. 4).

Claims 28 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurita (US Pub. 2002/0135057) in view of Sakamoto et al. (US 6,791,199).

With regard to claims 28 and 37, Kurita does not disclose the insulating resin is thermoplastic or thermosetting resin. However, Sakamoto et al. disclose the insulating resin could be a thermosetting resin (Sakamoto col. 4, lines 50-54). Sakamoto et al. teach the thermosetting resin could be molded, injected, dipped or painted on (Sakamoto col. 7, lines 6-10). Thus, it would have been obvious at the time the invention was made to modify Kurita's device with the teaching of Sakamoto et al. to use a thermosetting resin in order to be easily applied or formed.

***Response to Arguments***

Applicant's arguments filed 11/7/08 have been fully considered but they are not persuasive.

- Applicant argues that "Kurita does not need to have a pointed electrode" (see page 8 of the remarks) and "the tip portion of Matsumura in fact provides a desirable permanent contact with the electrical parts" (see page 9 of the remarks). However, Kurita discloses the IC chip 1 are electrically connected to desired wiring of wiring layer 3 (¶ [0028]) and Matsumura discloses a bump with high-hardness shard tip to improve the electric contact with other electric parts (Matsumura ¶ [0049]). Therefore, combining Kurita and Matsumura would improve the electric contact between the IC chip 1 and the electrical parts on wiring layer 3 and the combination of two references is proper.
- Applicant argues the tip portion provides a permanent or momentary contact (see page 9). However, what type of contact is not in the claims. The argument is moot.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is 571-272-1709. The examiner can normally be reached on 7:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wai-Sing Louie/
Primary Examiner, Art Unit 2814

Wsl
January 29, 2009.